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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|
|-----------------|-------------|----------------------|---------------------|

09/535, 158 03/24/00 AOKI

K 0557-49331-2

MMC2/1010  
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EXAMINER

GRAINGER, Q

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2852

DATE MAILED: 10/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

|                              |                 |              |
|------------------------------|-----------------|--------------|
| <b>Office Action Summary</b> | Application No. | Applicant(s) |
|                              | 09/535,158      | AOKI ET AL.  |
|                              | Examiner        | Art Unit     |
|                              | Quana Grainger  | 2852         |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 18 July 2000.
- 2a) This action is FINAL.                  2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-29 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2, 15-16, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono in view of the admitted prior art of record.

Ono teaches comprises a latent image bearing member having a photoconductive surface with a latent image including image areas, at least some of said image areas having different image potential values thereon; and a developing device configured to perform a developing operation with a one-component developer including toner particles, the developing device including, a conveyor member configured to convey the one-component developer from a one-component developer

supply and to deliver the one-component developer with a predetermined amount of charge to a developing region where a conveyor surface portion of the conveyor member is closely spaced from and opposed to a photoconductive surface portion of the latent image bearing member, a thin layer forming device configured to form the one-component developer being conveyed on the conveyor member into a uniform thin layer prior to the one-component developer with the predetermined amount of charge being delivered to the developing region, and a voltage source configured to apply a developing bias voltage to the conveyor member when the developing operation is performed to move at least some of the one-component developer with a predetermined charge adhering to the conveyor surface portion to the photoconductive surface portion to form saturated amounts of the one-component developer on the image areas of the photoconductive surface portion, wherein the saturated amounts do not change with increases of the image potential above a predetermined threshold value to provide an image having a density determined by the saturated amounts. The amount of the one component developer adhering to the conveyor surface portion is about 0.5 mg/cm<sup>2</sup> (abstract).

Ono also teaches an image forming apparatus comprising means for bearing a latent image including image areas, at least some of said image areas having different image potential values thereon; and means for performing a developing operation using a one-component developer including toner particles, the developing operation performing means including, means for conveying the one-component developer from a one-component developer supply and to deliver the one-component developer with a

predetermined amount of charge to a developing region where a portion of the means for conveying is closely spaced from and opposed to a portion of the means for bearing a latent image, means for forming a uniform thin layer of the one-component developer on the means for conveying prior to the one-component developer with the predetermined amount of charge being delivered to the developing region, and means for applying a developing bias voltage to the means for conveying when the developing operation is performed to move at least some of the one component developer with a predetermined charge adhering to the portion of the means for conveying to the portion of the means for bearing a latent image to form saturated amounts of the one-component developer on the image areas of the portion of the means for bearing a latent image, wherein the saturated amounts do not change with increases of the image potential above a predetermined threshold value to provide an image having a density determined by the saturated amounts.

Ono does not teach two level developing. The admitted prior art of record teaches a two level developing method and that this method is conventional and known in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the teaching of Ono with an image forming device using a developing method such as taught by the admitted prior art of record to obtain high grade images without fogging (purpose: lines 1-5).

Claims 1, 3, 5, 7, 12, 14-15, 17, 19, 21, and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. in view of the admitted prior art of record.

Shin et al. teaches a latent image bearing member having a photoconductive surface with a latent image including image areas, at least some of said image areas having different image potential values thereon; and a developing device configured to perform a two-level developing operation with a one-component developer including toner particles, the developing device including, a conveyor member configured to convey the one-component developer from a one-component developer supply and to deliver the one-component developer with a predetermined amount of charge to a developing region where a conveyor surface portion of the conveyor member is closely spaced from and opposed to a photoconductive surface portion of the latent image bearing member, a thin layer forming device configured to form the one-component developer being conveyed on the conveyor member into a uniform thin layer prior to the one-component developer with the predetermined amount of charge being delivered to the developing region, and a voltage source configured to apply a developing bias voltage to the conveyor member when the developing operation is performed to move at least some of the one-component developer with a predetermined charge adhering to the conveyor surface portion to the photoconductive surface portion to form saturated amounts of the one-component developer on the image areas of the photoconductive surface portion, wherein the saturated amounts do not change with increases of the image potential above a predetermined threshold value to provide an image having a

density determined by the saturated amounts. The development region includes a gap between the conveyor surface portion and the opposed photoconductive surface portion that is equal to or less than about 150 micron (column 5, lines 61-63). Shin et al. also teaches an image forming apparatus comprising means for bearing a latent image including image areas, at least some of said image areas having different image potential values thereon; and means for performing a developing operation using a one-component developer including toner particles, the developing operation performing means including, means for conveying the one-component developer from a one-component developer supply and to deliver the one-component developer with a predetermined amount of charge to a developing region where a portion of the means for conveying is closely spaced from and opposed to a portion of the means for bearing a latent image, means for forming a uniform thin layer of the one-component developer on the means for conveying prior to the one-component developer with the predetermined amount of charge being delivered to the developing region, and means for applying a developing bias voltage to the means for conveying when the developing operation is performed to move at least some of the one component developer with a predetermined charge adhering to the portion of the means for conveying to the portion of the means for bearing a latent image to form saturated amounts of the one-component developer on the image areas of the portion of the means for bearing a latent image, wherein the saturated amounts do not change with increases of the image potential above a predetermined threshold value to provide an image having a density determined by the saturated amounts. The thin layer forming device configured to form

- the one-component developer on the conveyor member into a uniform thin layer having a height corresponding to 1 to 1.5 times a diameter of the toner particles of the one-component developer (column 5, lines 27-30). The predetermined charge is about 10 micro C/g (column 3, line 12-14).

Shin et al. does not teach a two level developing method. The admitted prior art of record teaches that a two level developing method is conventional. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the teaching of Shin et al. with an image forming device using a developing method such as taught by the admitted prior art of record to obtain desirable images having both solid and line quality (column 4, lines 10-14).

Claims 4, 6, 8-11, 13, 18, 20, 22-25, and 27, are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. in view of the admitted prior art of record and further in view of Kinoshita. Shin et al. teaches a developing bias having a superimposed AC voltage; and a thin layer forming device in pressure contact with the developer-bearing member that protrudes from the holder. Shin et al. does not teach an image forming apparatus wherein substantially all of the one-component developer on the conveyor surface portion is moved during the forming of the saturated amounts; the developing bias voltage applied to the conveyor member by the voltage source is an AC voltage superimposed on a DC voltage, said AC voltage having a peak-to-peak voltage value from 600 to 1200 volts and a frequency from 2 to 6 kHz; that the thin layer forming device protrudes from a holder with a protruding length of 10 to 15 mm; the thin layer

- forming device contacts the developer-bearing member with a contact pressure of about 10 to about 150 g/cm; nor a surface roughness of the conveyor member is set from about 1 to about 4 micron RZ.

Kinoshita teaches a conveying member having a surface roughness (column 8, lines 1-9) and a thin layer forming device contacts the developer-bearing member with a contact pressure of about 10 to about 150 g/cm (column 6, line 65 - column 7, line 3).

As discussed above, Shin et al. does not teach the claimed developing bias and Shin et al. in view of Kinoshita ~~does not state~~ the claimed surface roughness for the thin layer forming device. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the appropriate values for these components, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-29 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quana Grainger whose telephone number is 703 308-7616. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Arthur Grimley can be reached on 703 308-1373. The fax phone numbers

Art Unit: 2852

- for the organization where this application or proceeding is assigned are 703 305-3230 for regular communications and 703 305-3230 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



QG  
October 9, 2001